pectoris; it has been reproduced both by exercise testing and rapid atrial pacing and is associated with typical electrocardiographic changes. I believe that symptomatic angina occurs in about one quarter of heart transplant patients. Presumably the basis is re-innervation.

JMP: We performed a study in 28 cardiac transplant patients having a second operation up to five years after transplantation, and we could not find any anatomical evidence of re-innervation.

PNH: Perhaps there was some re-innervation in the present case which took longer than five years, although an alternative mechanism for pain might be ischaemia of the residual native atrial tissue left in situ.

RH: My right atrium is certainly sensitive to manipulation at catheterisation, and about one in four of my 28 ventricular biopsies have been painful.

KAD: Does the type of plasma concentration of paraprotein or the findings on serum amyloid P component scintigraphy have any prognostic value in systemic AL amyloidosis?

PNH: A serum paraprotein is often completely absent in AL amyloidosis, and even free monoclonal immunoglobulin light chains cannot be found in the urine of 15% of patients. The biophysical properties of the monoclonal protein, which are unique in each case, presumably do have an influence on the disease. We have noted that long term survival is associated with, among other things, a small whole body load of amyloid, as shown by serum amyloid P component scanning. The factors that ultimately affect survival include not only the anatomical distribution and extent of the amyloid but also the effect it has on organ function, which varies remarkably from case to case and possibly at different times in the same patient.

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Scenario analysis of the future of medicines

Hubert Leufkens, Flora Haaijer-Ruskamp, Albert Bakker, Graham Dukes

Planning future policy for medicines poses difficult problems. The main players in the drug business have their own views as to how the world around them functions and how the future of medicines should be shaped. In this paper we show how a scenario analysis can provide a powerful teaching device to readjust peoples' preconceptions. Scenarios are plausible, not probable or preferable, portraits of alternative futures. A series of four of alternative scenarios were constructed: "sobriety in sufficiency," "risk avoidance," "technology on demand," and "free market unfettered." Each scenario was drawn as a narrative, documented quantitatively wherever possible, that described the world as it might be if particular trends were to dominate development. The medical community and health policy makers may use scenarios to take a long term view in order to be prepared adequately for the future.

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Public policy decisions about health care can have repercussions on society that extend far into the future; if they are to be sound they should be based on a solid understanding of the processes that have led to the current situation and some reasoned analysis of the role that these and other factors are likely to play in the foreseeable future. With medicines, this type of policy planning poses peculiarly difficult problems. The existing situation of drug development and treatment is not stable and is not free of conflict and controversy. New discoveries constantly advance the possibilities of drug treatment, but at the same time society is increasingly concerned about rising drug costs, safety issues, and the sometimes irrational use of existing medicines.[1-3] Research on medical outcomes clearly shows the need for a quantified insight into how drug treatment is actually conducted and what its positive and negative consequences are in terms of health, cost, and value for society as a whole.[4]

The future place of drugs in health care will clearly depend on these issues and on others. The effects of harmonising the regulation of medicines across Europe —a continent in which the traditions of drug use are highly divergent—cannot be predicted.[5,6] Another uncertain issue is the use and funding of expensive experimental treatments for conditions such as cancer and AIDS.[7,8] The main players in the drug business—prescribers, the pharmaceutical industry, pharmacists, regulators, and insurers—all have their own (and sometimes substantially different) views as to how the world around them functions and how the future of medicines should be shaped. Not surprisingly, therefore, there are conflicts of interest and view, particularly where costs, freedom of choice, legislation, and the financing of research are concerned; measures introduced with the best of intentions for one group can undermine the valid interests of another.[4,9]

For more than a decade, the government of the Netherlands has maintained a steering committee on future health scenarios (STG) to develop analyses that can provide a basis for developing health policies. One such analysis, relating to the role of medicines in health care, was undertaken during 1991-3, and the main results were presented in June 1993.[10] During the study and discussions with the different stakeholders after the presentation in 1993 it became clear that the processes influencing medicines are almost exclusively of global dimensions; what applies in the Netherlands is likely to be applicable in a large part of the Western world. In this paper we hope to show, in the light of this study, how such a scenario analysis can provide an innovative approach to a complex health situation.

Development of scenarios

The scenario planners who undertook this study applied concepts and techniques that have been widely used in the business world, particularly in large corporations (for example, Shell petrochemical company), but which have been used relatively little for setting public policy goals.[11-13] Scenarios are plausible, not probable or preferable, portraits of alternative futures.[13] They are not blueprints or forecasts of the world ahead. Their purpose is to help policy makers to take a long term view and, by doing so, to readjust their preconceptions. Preparing for plausible futures helps us generate the knowledge and ways of thinking to deal with the real future. For example, such plausible scenarios helped prepare Shell's management, in terms of their thinking and operations, for the 1973 oil crisis. Since no other major oil company had seriously envisaged radical shifts in the price of oil, the scenarios enabled Shell to steal a march on its competitors.[11 12] Scenario planners in the company were instructed to bring forth unthinkable ideas and to confront top management with oncoming bad news to prevent them being taken by surprise.

A systematic step approach is an important prerequisite in developing scenarios.[13] The first step in our scenario analysis was the identification of the "domain of analysis," which included an extensive portrayal of the topic of interest (the world of medicines in the broadest sense), the external environment in which it functions, and the critical uncertainties relating to it.

The next step was the identification of current uncertainties and of driving forces—major trends and forces affecting medicines: demographic changes, ongoing internationalisation, scientific and technological development, socioeconomic change, informatics, and consumerism. It was clear, however, that even if these six key forces were to be the only specific determinants of the future, the outcome of their interaction might take quite different and sometimes contradictory forms. For example, there is a growing trust in free market forces, driven by international developments and increasing technological possibilities. In contrast to this, equal access to health care services, containment of costs, and the fear of health hazards often call for more coordination.

The relative influences of the determinants of the future were captured into two major dimensions (called scenario drivers): one dimension ran from a strong emphasis on free market forces to a strong attachment to coordination and regulation; the second prevailing dimension ran from, at one extreme, great aversion to and fear of medical technology to, at the other extreme, technology being seen as a blessing and the most important, if not the only, tool of value in solving future problems. On the basis of these two dimensions the study team set out four alternative scenarios: "sobriety in sufficiency," "risk avoidance," "technology on demand," and "free market unfettered." Their main characteristics are summarised in the table.

Each scenario was drawn as a portrait of the future, a narrative describing the world as it might be if particular trends were to dominate. The scenarios were documented quantitatively whenever possible, the figures used being plausible estimates based on published data on volume and value of drug use for the year 1990 as modified in the light of the scenario concerned. The quantitative underpinning of the scenarios followed from a mixed modelling (that is, demographic changes on the basis of forecasts of the Central Bureau of Statistics) and weighted estimation of changes derived from the substance of the scenario. The data underlying the quantitative underpinning came from the national health insurance funds council and the PHARMO drug utilisation database of Utrecht University. Thus, firm facts were consistently complemented by estimates from groups that included expert representatives from all the main parties in the drug business (for example, minimum and maximum estimates of the impact of past breakthroughs, of changes in regulation, etc).

Four alternative futures of medicines

SOBRIETY IN SUFFICIENCY

This scenario anticipates a dramatic shift in social values resulting in a culture of restraint. During this moral transition people reject the consumer society and concentrate on essential, intrinsic values. The driving forces in this scenario are a mixture of traditional Protestant notions of restraint and moderation and sincere concern about the consequences of the consumer society for the environment, social relationships, and dialogue between the developed and developing worlds. The changes in society enjoy general acceptance by the public. Another driving force is a balanced awareness of the blessings and limitations of technology. A series of failures of the high tech approach has lead to a more cautious view of medical technology rather than as a panacea for solving health problems.

Solidarity and collectivism are the pillars of equal access to health care. A minimum package of health care benefits is designed to ensure the rational use of services, care, and drugs. Compliance with this minimum package is reinforced by a high degree of coordination and regulation. Individual decision making by doctors, pharmacists, and other health care workers belongs to the past. They now work with protocols and with defined standards for the quality of care set out at the collective level (for example, by professional organisations). New medicines are viewed with reserve, and existing treatments are preferred.

Patients are increasingly professional. They expect restraint in medical care and assume individual responsibility for decisions about lifestyle, disease prevention, self care, and use of health care services. In this scenario society has chosen restraint and sustained development. This is not a climate in which innovation will flourish.

Features of four different scenarios on future of medicines

Features	Sobriety in sufficiency	Risk avoidance	Technology on demand	Free market unfettered
Coordination	Strong, emphasis on sustained development	Strong, control of risks	Moderate, technology driven	Little, free market driven
Technology culture	Moral transition, culture of restraint	Mistrust, strong perception of risks	Technological optimism	Strong consumerist attitude
Health system	Essentials, managed care, solidarity	Chaos, irrational weighing	High tech cure, telemedicine	Competitive, pluralism, inequality
Professional care	Protocols, in balance with self care	Defensive medicine, risk avoidance	Centralised clinics, professional dominance	Medical tourism, focus on self care
Use of medicines	When necessary, focus on natural remedies as well	Drugs are poison	Great trust, medicines are cost effective	Consumption orientated, health products
Drug research	Improvement of existing drugs, generic drugs	Crisis, risk avoidance	Beyond frontiers, successful	Line extension, short term orientation

RISK AVOIDANCE

This scenario is characterised by a general feeling of mistrust of technology. Some of the same trends emerge as in the previous scenario but to a different degree and for different reasons. Here strong public concern about health hazards cripples rational decision making. Environmental issues (such as acid rain, smog, and the ozone layer) have sensitised society and contributed to widespread disquiet about technological developments. In the late '90s several new drug treatments prove unsuccessful and attract attention because of their possible health hazards. In this climate of aversion and fear rational weighing up of the risks and benefits of medicines is hardly possible. Emotions control the debate, and there is a generally accepted notion that medicines are poison.

In this climate the practice of medicine becomes highly defensive and conservative. If medical treatment is prescribed at all, the emphasis is on care rather than cure, and high tech approaches are avoided wherever possible. Hospitals provide several models of care with a focus on empathy and behavioral medicine. "Natural" remedies (homoeopathy, herbal medicines, etc) become increasingly popular because of their supposed safety. The media play an important role in disseminating information about risk and safety issues. Consumer organisations are important and play a prominent role as guardians of the public interest. Legal protection of consumers has been greatly expanded, bringing the issue of liability to the forefront of society's interests. What started as a reaction to the technological dominance of the '90s and a reasonable concern about health hazards has become an uncontrolled process of uncertainty, fear, litigation, and avoidance behaviour to the extent that the risks of avoidance itself become ever more visible.

TECHNOLOGY ON DEMAND

This scenario is driven by technological optimism, and its dominant feature is a powerful belief in the promises of technology. Technological change is considered as the major force for economic progress and innovation. High tech developments enjoy widespread appreciation. Medical and environmental technology burgeon and contribute to renewed confidence in technology's contribution to solving medical and social problems. Trust in the efforts of drug research is reinforced by the emergence of a series of successful new drug treatments.

Doctors, pharmacists, and other professionals provide health services with a focus on high tech cures rather than care. Disease prevention is well developed, with widespread adoption of screening, use of self diagnostic kits, and other innovations in prevention; this becomes an important prerequisite for the use of long term corrective treatment (for example, with cholesterol lowering agents or antidiabetes drugs). Prophylactic drugs are adopted as a major strategy in improving the health of the population, and early detection of disease is therefore needed.

In this process advanced computer and information systems are applied in quality assurance, monitoring of drug usage, patient compliance, and evaluation of medical outcomes. Such systems offer opportunities for patients at home to communicate with their doctors and pharmacists; the professionals engage in telediagnosis, and the patients interactively acquire individualised medical information. In this scenario the public gives great credit to technology, particularly in health care. Trust in medical technology is implicit, and technology gets the chance to prove its value.

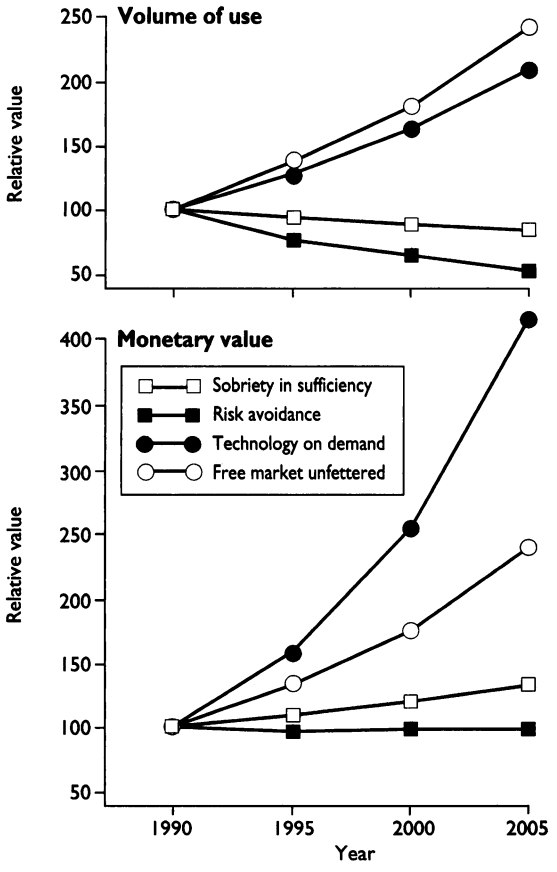
FREE MARKET UNFETTERED

This scenario represents a portrait of the future in which the world of health care is dominated by market forces. This is predominantly the result of a renaissance of the European free market system in the late '90s. The international character of the marketplace stimulates the development and marketing of new products and services. These developments are accompanied by high consumption, a focus on self help, and demand for medical technology and health care services. Society wants to enjoy all the opportunities that present themselves. Notably, elderly people—a group with a particular need for medical services—take advantage of these possibilities. Many older people are now relatively affluent as a result of the attractive retirement schemes built up during the last quarter of the 20th century. European regulation of medicines stimulates a free exchange of products and services and encourages multilateral competition between countries and suppliers. Many products are available, and prices are competitive. Intensive promotion and advertising are prominent features of this scenario.

The negative aspect of this scenario is the acceptance of inequality in society. In this market driven system solidarity is no longer a prerequisite. Large parts of the population cannot benefit from all the advances made in this scenario and have no access to reasonably affordable modern drugs. The rich in society rate individual health highly and are willing to spend much of their income on medical checkups, health farms, and general care. Medical tourism has become popular and provides a constant stimulus for renewal of the available health care package. The world is an open system, with pluralism and free consumption as dominant values.

Discussion

In no sense is the future predictable, but it can be useful to sketch a series of plausible alternative futures.



Estimated changes in volume and monetary value of drug use 1990-2005. Values are relative to 1990 values (volume of 83 million prescriptions, excluding hospitals and over the counter drugs; monetary value 2·8 billion Dutch guilders, excluding dispensing costs), which are given as 100

Each represents an extreme development in a particular direction, perhaps something of a caricature, but taken as a group they mark out the limits within which the future is likely to lie. The real future will therefore probably lie between these extremes, having some characteristics of each.

The large differences between these four scenarios, all of which are plausible, may be shown by one example, the level of drug use in these alternative futures. The figure shows drug use expressed in terms of volume and monetary value compared with that in 1990. The estimated volume of drug use in the year 2005 ranges from 54 (risk avoidance) to 239 (free market unfettered), while the monetary value of drug use ranges from 100 (risk avoidance) to 418 (technology on demand).

The scenarios are intended to confront key players in the drug business with possibilities that they have not foreseen. Policy makers may find it useful for showing the limits within which they can influence change and the factors which have to be taken into account. They will be able to consider the future role of the various key players—including prescribers, pharmaceutical researchers, and suppliers of over the counter medicines—against these various alternative backgrounds. Used methodically and creatively, scenario analysis can be a teaching device and a powerful technique for adjusting preconceptions in laying a basis for community policies well into the 21st century.

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The profession of medicine

Kenneth Calman

Where there is no vision the people perish—PROVERBS

It seems timely to define the purpose of medicine and examine the concept of a profession. This paper does so in the wider context of health, values in society, and the need to involve patients and the public as a whole. The author looks closely at what doctors do and concludes that making the diagnosis is a key element. The consultation is the building block for resource allocation. In addition to the diagnosis it sets out the prognosis and possible treatment and emphasises the importance of communicating these to the patient. Looking at the kind of doctor we need raises such issues as ethical standards, continuing professional development, team working, clinical standards, quality, outcomes, and research and development. Throughout, the role of education is seen as crucial. Leadership and vision are required by senior members of the profession if the opportunities presented are to be developed further.

There is increasing public and professional interest in medicine, with questioning of professional standards and the quality of care. Public expectations of the level of service to be delivered are rising. It is timely, therefore, to review the role and purpose of medicine and the concept of a profession.

At the outset let me make it clear that the medical profession in Britain provides a service to individuals and the population which is the envy of the world. The commitment to provide such a service within the NHS is real and deeply held. Because of this the profession has nothing to fear by being open and encouraging debate on how services could be even better. And that is the thread which goes through this paper—that doctors provide one of the most valued services in Britain and are held in high esteem but will continue to do so only if they take the lead in promoting change and improvement. In other words doctors must consider their role as a profession.

Before getting into the substance of the paper let me first try to put this topic into context and set out six key issues which govern my thinking on health and health care. I have developed these elsewhere, and they include the importance of health, of patient and public involvement, in measuring outcomes, intelligence systems, ethical issues, and the education and research base.[1]

This paper will consider some of these issues in more detail.

What is the purpose of medicine?

The purpose of medicine is to serve the community by continually improving health, health care, and quality of life for the individual and the population by health promotion, prevention of illness, treatment and care, and the effective use of resources, all within the context of a team approach. This emphasises a series of key issues, including the focus on patients, health and quality of life, the use of resources, and the team approach. Each of of these I will discuss in more detail below.

It was Disraeli who said, "The health of the people is really the foundation upon which all their powers of state depend." This emphasises the importance of the health of the nation for economic and social wellbeing of the population, in addition to its importance to the individual.

What is a profession?

It is not easy to define a profession, but it is likely to have some or all of the following characteristics. It is a vocation or calling and implies service to others; it has a distinctive knowledge base which is kept up to date; it determines its own standards and sets its own examinations; it has a special relationship with those whom it serves—patients, clients; it has particular ethical principles—the ethical base; it is self regulating and is accountable to patients and to the profession itself.

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